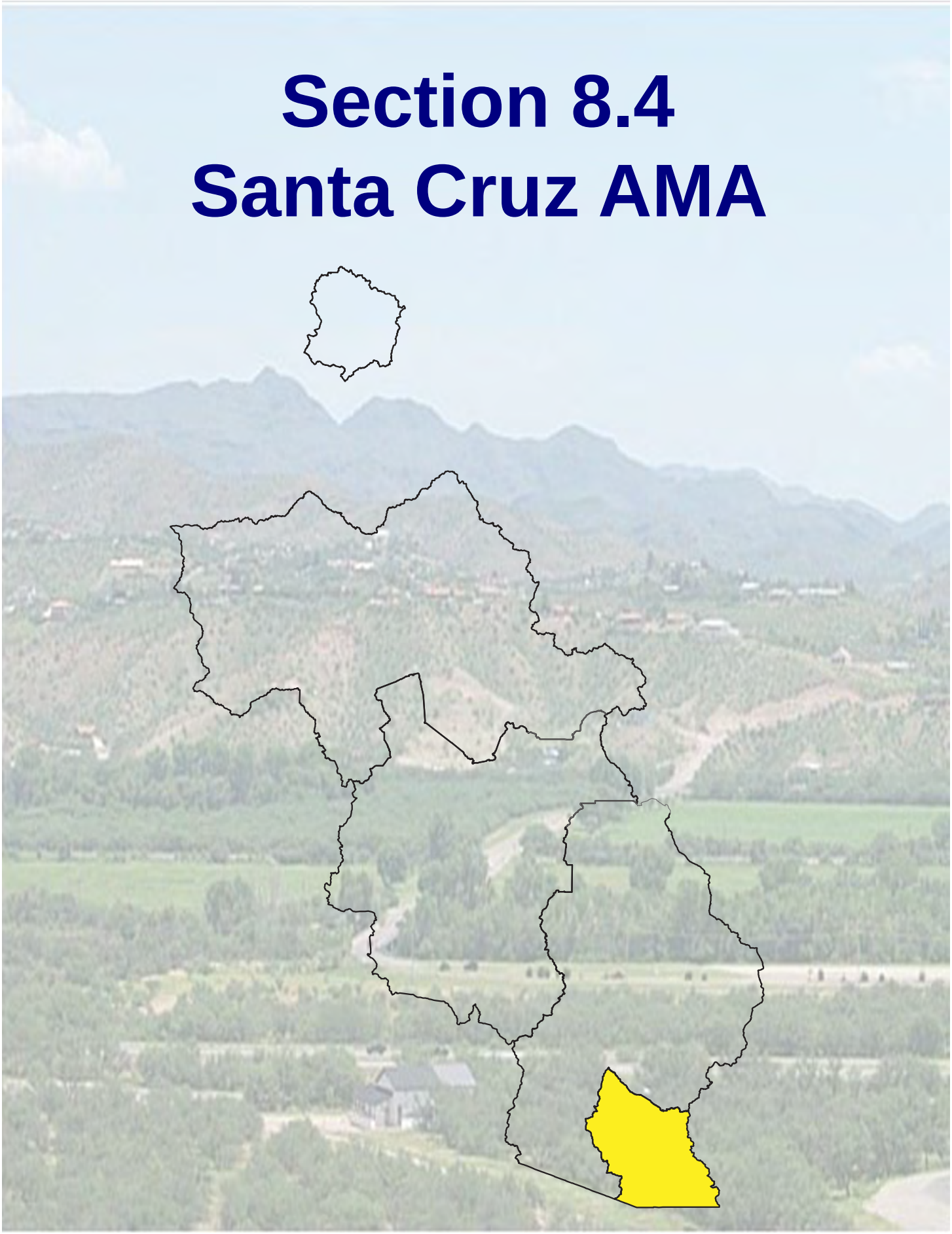
Section 8.4
Santa Cruz AMA



8.4.1 Geography of the Santa Cruz AMA

The Santa Cruz AMA is 716 square miles in area. Geographic features and principal communities are shown on Figure 8.4-1. The AMA is characterized by mid to high elevation mountains surrounding the Santa Cruz River Valley. Vegetation types include southwestern grassland, madrean evergreen woodland and riparian species, principally found along the Santa Cruz River and Sonoita Creek (See Figure 8.0-10)

- Principal geographic features shown on Figure 8.4-1 are:
    - The Santa Cruz River flowing north in the center of the AMA
    - Sonoita Creek running from the eastern AMA boundary to its confluence with the Santa Cruz River near Rio Rico
    - The Sierrita and Santa Rita Mountains on the northern AMA boundary, the San Cayetano and Santa Rita Mountains on the eastern boundary, and the Pajarito, Atascosa and Tumacacori Mountains on the western boundary.
    - The lowest point in the AMA at 3,000 feet where the Santa Cruz River exits the AMA
    - The highest point in the AMA at 9,453 feet at Mt. Wrightson in the Santa Rita Mountains

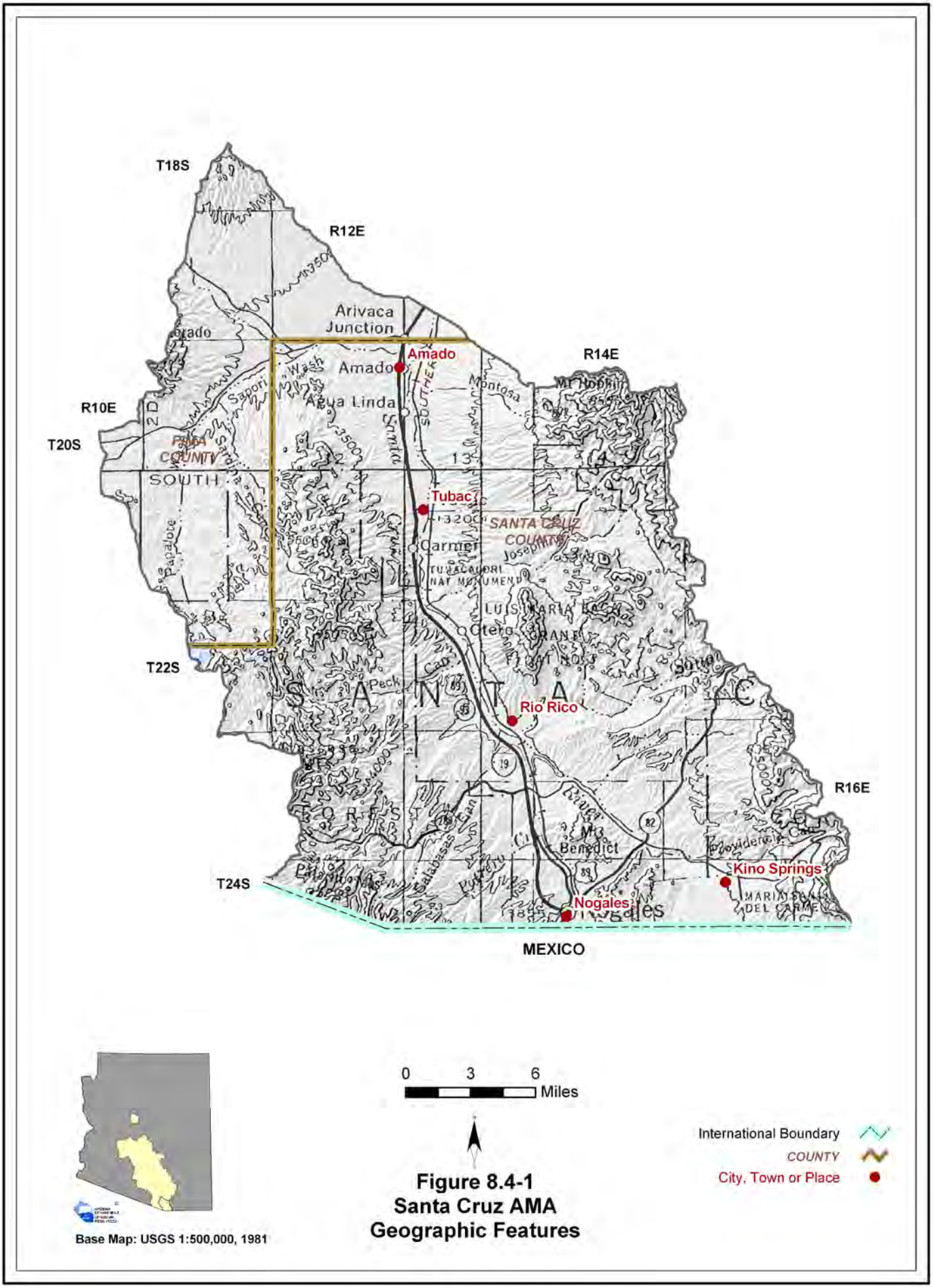


Figure 8.4-1
Santa Cruz AMA
Geographic Features

8.4.2 Land Ownership in the Santa Cruz AMA

Land ownership, including the percentage of ownership by category, for the Santa Cruz AMA is shown in Figure 8.4-2. Features of land ownership in the AMA are contiguous areas of private and forest service land. A description of land ownership data sources and methods is found in Volume 1, Section 1.3.8. Land ownership categories are discussed below in the order of percentage from largest to smallest in the AMA.

Private

- 42.6% of the land is private.
- Land uses include domestic, commercial, agriculture and grazing.

National Forest

- 35.7% of the land is federally owned and managed as the Coronado National Forest.
- The AMA contains 5,540 acres of the 15,860-acre Mt. Wrightson Wilderness in the northeast corner (See Figure 8.0-13).
- Land uses include resource conservation, recreation and grazing.

State Trust Land

- 21.3% of the land is held in trust for the public schools and other beneficiaries under the State Trust Land system.
- Primary land use is grazing.

U.S. Bureau of Land Management (BLM)

- 0.2% of the land is federally owned and managed by the Tucson Field Office of the U.S. Bureau of Land Management.
- Primary land use is grazing.

Other

- 0.1% of the land is owned and managed by Arizona State Parks as Patagonia State Park and Tubac Presidio State Historic Park.
- Primary land use is recreation.

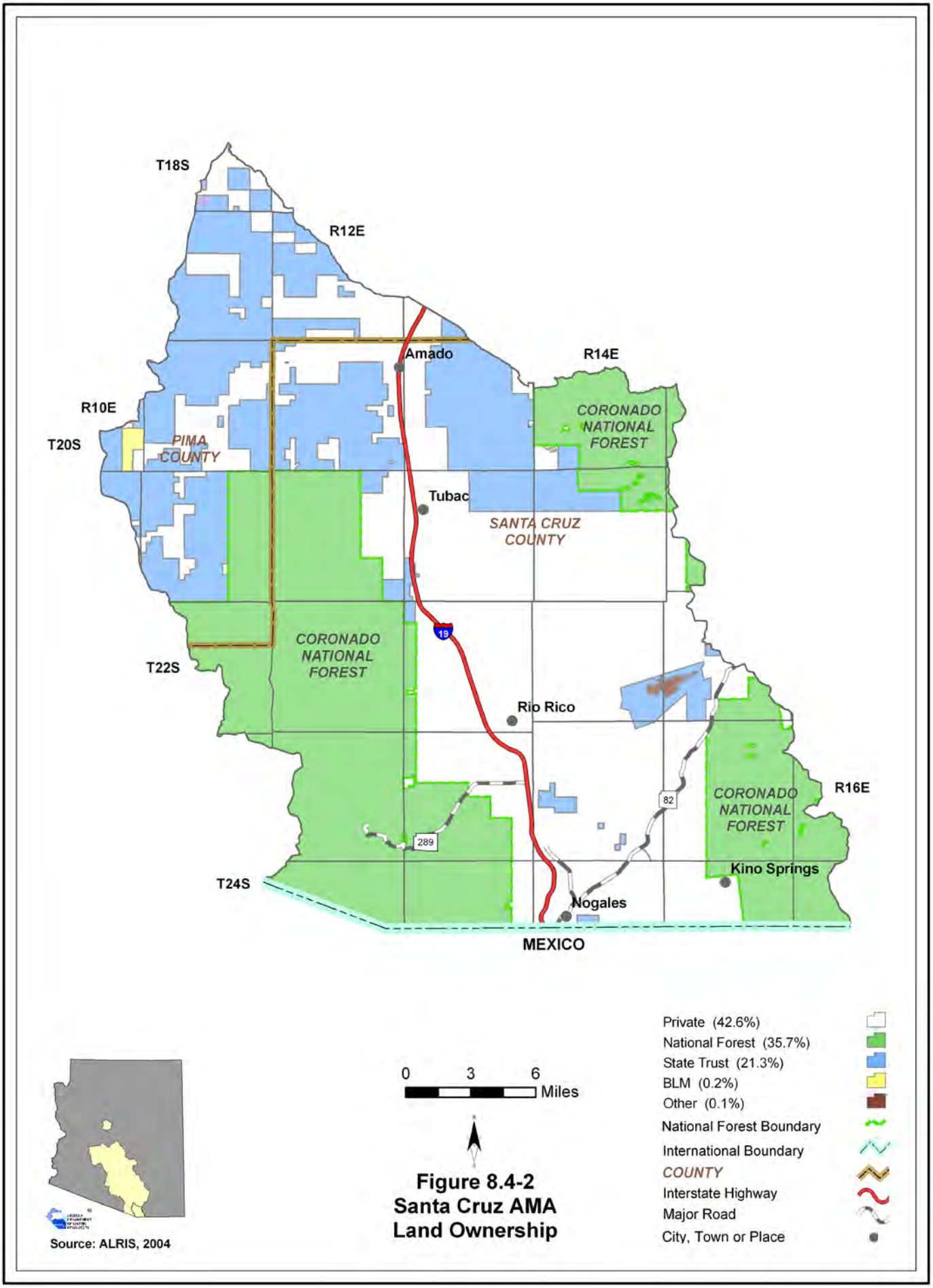


Figure 8.4-2
Santa Cruz AMA
Land Ownership

8.4.3 Climate of the Santa Cruz AMA

Climate data from NOAA/NWS Co-op Network and Evaporation Pan stations are complied in Table 8.4-1 and the locations are shown on Figure 8.4-3. Figure 8.4-3 also shows precipitation contour data from the Spatial Climate Analysis Service (SCAS) at Oregon State University. The Santa Cruz AMA does not contain AZMET or SNOTEL/Snowcourse stations. A description of the climate data sources and methods is found in Volume 1, Section 1.3.3.

NOAA/NWS Co-op Network

- Refer to Table 8.4-1A
- There are four NOAA/NWS Co-op Network stations in the AMA. The average monthly maximum temperature occurs in July and is between 78°F and 81.1°F. The average monthly minimum temperature occurs in January and is between 45.5°F and 48.4°F.
- Highest average seasonal rainfall occurs in the summer (July-September). For the period of record used, the highest average annual rainfall is 19.03 inches at the Nogales 6N station and the lowest is 15.70 inches at the Old Nogales station.

Evaporation Pan

- Refer to Table 8.4-1B
- There is one Evaporation Pan station in the AMA. Elevation at the station is 3,560 feet and average annual evaporation is 91.2 inches.

SCAS Precipitation Data

- See Figure 8.4-3
- Additional precipitation data shows average annual rainfall as high as 36 inches on the eastern AMA boundary and as low as 14 inches in the center of the AMA in the vicinity of Amado and Tubac.

Table 8.4-1 Climate Data for the Santa Cruz AMA

A. NOAA/NWS Co-op Network:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Monthly Average Temperature Range (in F)		Average Precipitation (in inches)				
			Max/Month	Min/Month	Winter	Spring	Summer	Fall	Annual
Nogales	3,813	1948-1983[1]	78/Jul	45.5/Jan	3.41	1.20	9.64	3.65	17.90
Nogales 6 N	3,560	1971-2000	78.9/Jul	45.5/Jan	3.40	1.35	10.19	4.09	19.03
Old Nogales	3,904	1892-1948[1]	80.1/Jul	46.6/Jan	2.59	0.92	9.59	2.60	15.70
Tumacacori Natl Monm	3,266	1971-2000	81.1/Jul	48.4/Jan	3.37	1.03	9.48	3.52	17.40

Source: WRCC
Notes:
[1]Average temperature data from period of record shown; average precipitation data from 1971 - 2000

B. Evaporation Pan:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Avg. Annual Evap (in inches)
Nogales 6 N	3,560	1952-2005	91.20

Source: WRCC

C. AZMET:

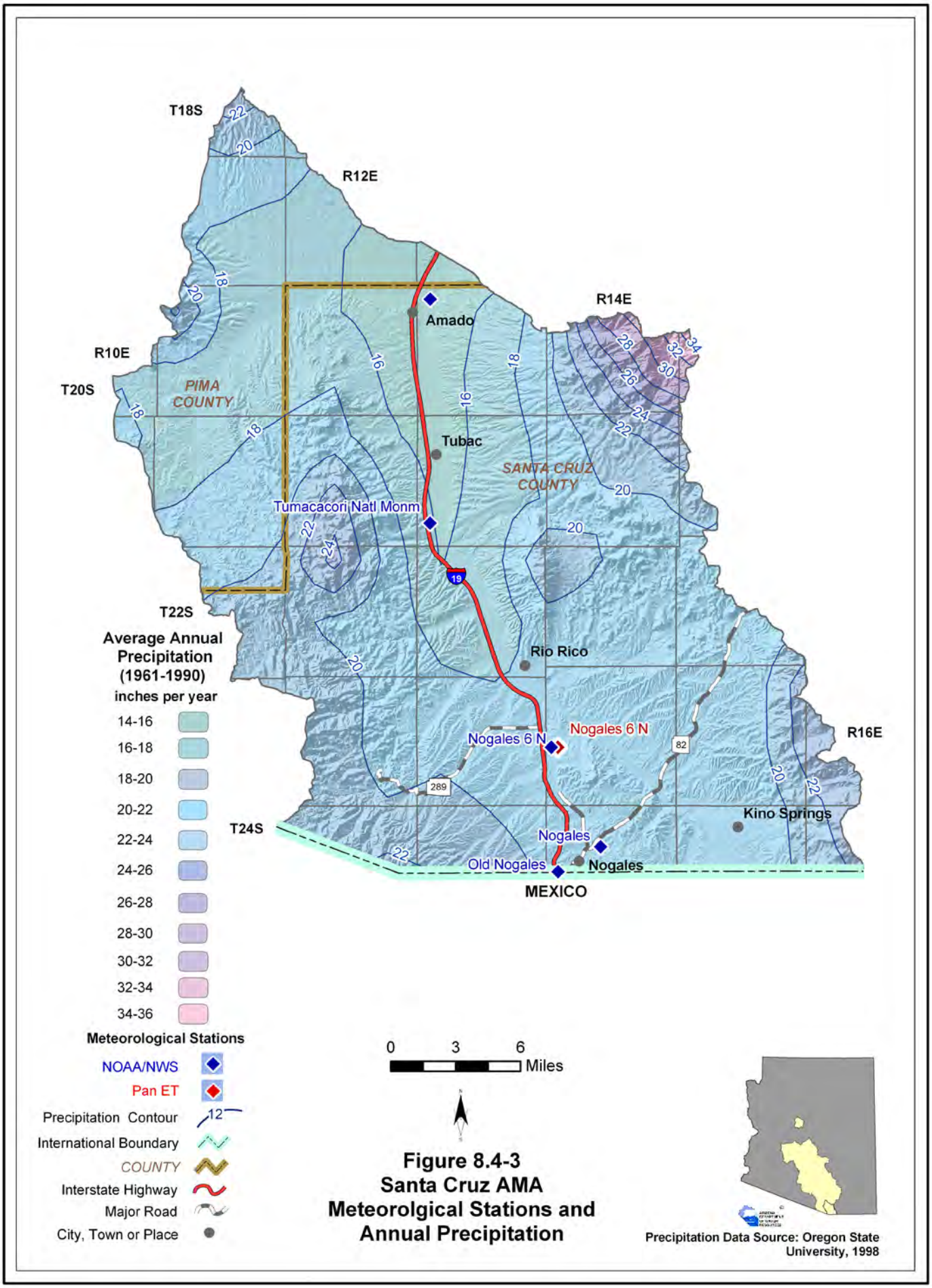
Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Annual Reference Evaportranspiration, in inches *(Number of years to calculate averages)*
None			

Source: Arizona Meteorological Network, 2004

D. SNOTEL/Snowcourse:

Station Name	Elevation (in feet)	Period of Record Used for Averages	Average Snowpack, at Beginning of the Month, as Inches Snow Water Content *(Number of measurements to calculate average)*					
			Jan.	Feb.	March	April	May	June
None								

Source: NRCS, 2005


T18S
R12E
R14E
R10E
T20S
PIMA COUNTY
SANTA CRUZ COUNTY
Amado
Tubac
Tumacacori Natl Monm
Rio Rico
Nogales 6 N
Nogales 6 N
Kino Springs
Nogales
Old Nogales
Nogales
MEXICO
T22S
T24S
R16E
19
82
289
Average Annual Precipitation (1961-1990)
inches per year
14-16
16-18
18-20
20-22
22-24
24-26
26-28
28-30
30-32
32-34
34-36
Meteorological Stations
NOAA/NWS
Pan ET
Precipitation Contour
International Boundary
COUNTY
Interstate Highway
Major Road
City, Town or Place
0 3 6
Miles
Figure 8.4-3
Santa Cruz AMA
Meteorolgical Stations and
Annual Precipitation
Precipitation Data Source: Oregon State University, 1998

8.4.4 Surface Water Conditions in the Santa Cruz AMA

Streamflow data, including average seasonal flow, annual flow and other information are shown in Table 8.4-2. Flood ALERT equipment in the AMA is shown in Table 8.4-3. Flood ALERT equipment information is current up to October 2005. New flood warning gages are routinely added to the ALERT network so the current number of stations may be greater. Reservoir and stockpond data, including maximum storage or maximum surface area, are shown in Table 8.4-4. The location of streamflow gages identified by USGS number, flood ALERT equipment and large reservoirs are shown on Figure 8.4-4. There are no USGS runoff contours in the Santa Cruz AMA. A description of stream data sources and methods is found in Volume 1, Section 1.3.16. A description of reservoir data sources and methods is found in Volume 1, Section 1.3.11. A description of stockpond data sources and methods is found in Volume 1, Section 1.3.15.

Streamflow Data

- Refer to Table 8.4-2.
- Data from four stations located at three watercourses are shown in the table and on Figure 8.4-4.
- Average seasonal flow is highest at all stations in the summer season (July-September).
- The largest annual flow recorded in the AMA is 88,145 acre feet in 1983 at the Santa Cruz River near Nogales gage with a contributing drainage area of 533 square miles.

Flood ALERT Equipment

- Refer to Table 8.4-3.
- There are three ALERT gages in the Santa Cruz AMA.

Reservoirs and Stockponds

- Refer to Table 8.4-4.
- The AMA contains two large reservoirs. The largest, Patagonia, has a maximum storage of 7,540 acre-feet.
- Surface water is stored or could be stored in four small reservoirs.
- There are 452 registered stockponds in the Santa Cruz AMA.

Table 8.4-2 Streamflow Data for the Santa Cruz AMA

Station Number	USGS Station Name	Drainage Area (in mi^2)	Mean Basin Elevation (in feet)	Period of Record	Average Seasonal Flow (% of annual flow)				Annual Flow/Year (in acre-feet)				Years of Record
					Winter	Spring	Summer	Fall	Minimum	Median	Mean	Maximum	
9480500	Santa Cruz River near Nogales	533	3,703	1913-current (real-time)	29	3	46	22	273 (2004)	14,013	18,627	88,145 (1983)	76
9481000	Nogales Wash at Nogales	37	3,753	1932-1934 (discontinued)	No statistics run, less than 3 years data								
9481500	Sonoita Creek near Patagonia	209	3,818	1930-1972 (discontinued)	23	9	50	18	1,431 (1944)	4,857	5,868	20,714 (1966)	39
9481740	Santa Cruz River at Tubac	NA	3,180	1995-current (real-time)	20	10	32	38	11,331 (1996)	16,837	25,276	82,257 (2000)	8

Sources: USGS NWIS, USGS 1998 and USGS 2005.

Notes:
NA = Not available
Statistics based on Calendar Year
Annual Flow statistics based on monthly values
Summation of Average Seasonal Flows may not equal 100 due to rounding
Period of record may not equal Year of Record used for annual Flow/Year statistics due to only using years with a 12 month recor

Table 8.4-3 Flood ALERT Equipment in the Santa Cruz AMA

Station ID	Station Name	Station Type	Install Date	Responsibility
2530	Potrero	Precipitation/Stage	10/16/2001	ADWR
2540	Las Canoas	Precipitation/Stage	10/15/2001	ADWR
2550	Nogales Wash	Precipitation/Stage	10/16/2001	ADWR
6060	SCR Conoa	Precipitation/Stage	3/1/1993	Pima Co FCD

ADWR = Arizona Department of Water Resources

FCD = Flood Control District

Table 8.4-4 Reservoirs and Stockponds in the Santa Cruz AMA

A. Large Reservoirs (500 acre-feet capacity and greater)

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM STORAGE (AF)	USE[1]	JURISDICTION
1	Patagonia	AZ Game and Fish Dept	7,540	R,S	State
2	Peña Blanca	Arizona State Parks	1,240	R	State

Source: U.S. Army Corps of Engineers 2005

B. Other Large Reservoirs (50 acre surface area or greater)

MAP KEY	RESERVOIR/LAKE NAME *(Name of dam, if different)*	OWNER/OPERATOR	MAXIMUM SURFACE AREA (acres)	USE[1]	JURISDICTION
None identified by ADWR at this time					

C. Small Reservoirs (greater than 15 acre-feet and less than 500 acre-feet capacity)

Total number: 1
Total maximum storage: 200 acre-feet

D. Other Small Reservoirs (between 5 and 50 acres surface area)[2]

Total number: 3
Total surface area: 26 acres

E. Stockponds (up to 15 acre-feet capacity)

Total number: 452

Notes:
[1] R = Recreation, S = Water Supply
[2]Capacity data is not available to ADWR

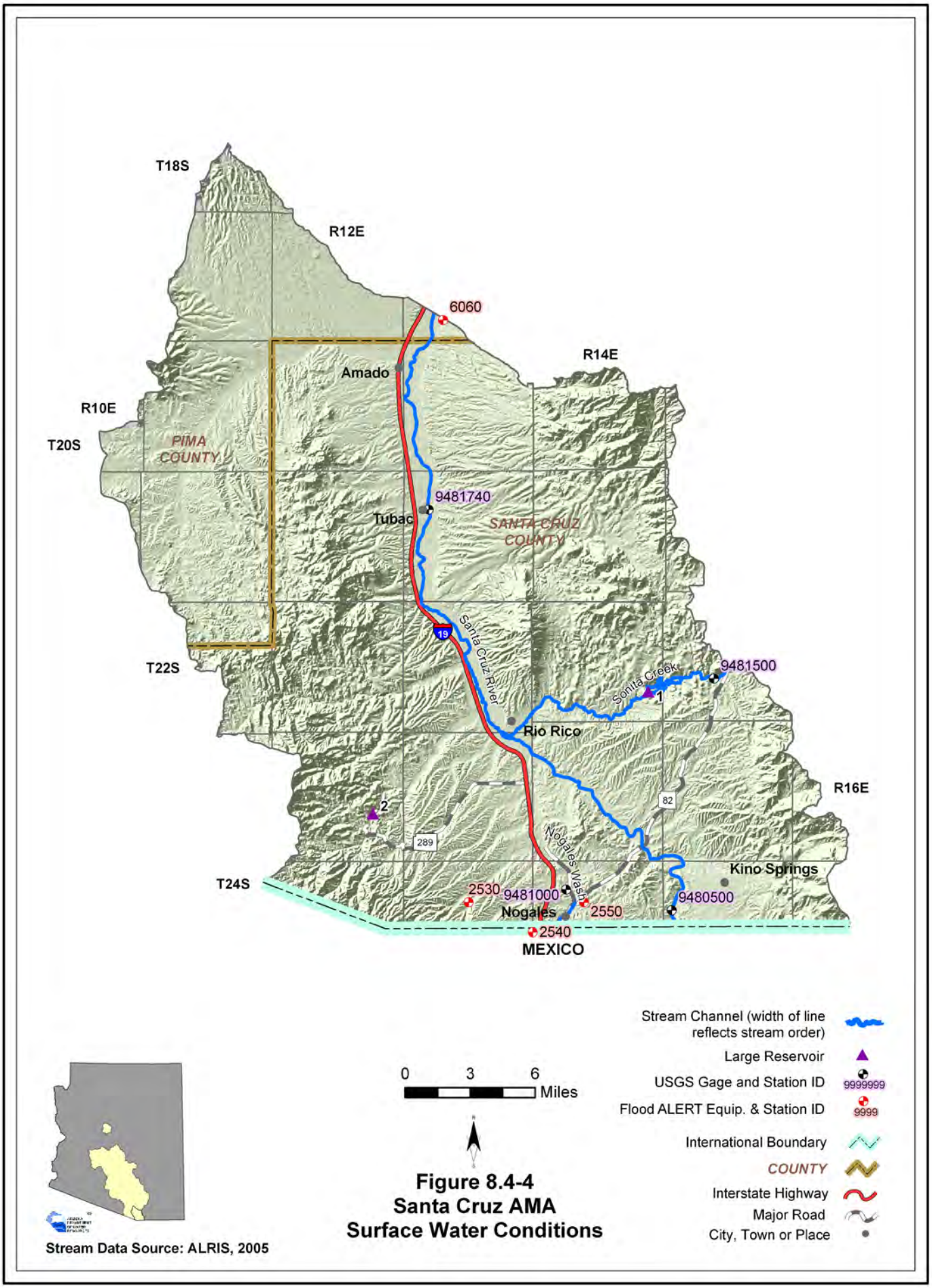


Figure 8.4-4
Santa Cruz AMA
Surface Water Conditions

8.4.5 Perennial/Intermittent Streams and Springs in the Santa Cruz AMA

Major and minor springs with discharge rates and date of measurement, and the total number of springs in the AMA are shown in Table 8.4-5. The locations of major springs and perennial and intermittent streams are shown on Figure 8.4-5. A description of data sources and methods for intermittent and perennial reaches is found in Volume 1, Section 1.3.16. A description of spring data sources and methods is found in Volume 1, Section 1.3.14.

- Perennial streams include reaches of the Santa Cruz River and Sonita Creek. The perennial reach of the Santa Cruz River is in a 12-mile long effluent dominated segment.
- A number of intermittent streams occur along the eastern AMA boundary.
- There are two major springs in the AMA with a measured discharge of 10 gallons per minute (gpm) or greater at any time.
- Springs with measured discharge of 1 to 10 gpm are not mapped but coordinates are given in Table 8.4-5B. There is one minor spring.
- Listed discharge rates may not be indicative of current conditions. Both measurements were taken during or prior to 1952.
- The total number of springs, regardless of discharge, identified by the USGS or ALRIS varies from 46 to 48, depending on the database reference.

Table 8.4-5 Springs in the Santa Cruz AMA

A. Major Springs (10 gpm or greater):

Map Key	Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
		Latitude	Longitude		
1	Sopori	314321	1110707	377	1/9/1952
2	Elias	314228	1110949	40	NA

B. Minor Springs (1 to 10 gpm):

Name	Location[1]		Discharge (in gpm)	Date Discharge Measured
	Latitude	Longitude		
Pena Blanca	312321	1110530	4	4/17/1946

C. Total number of springs, regardless of discharge, identified by USGS (see ALRIS, 2005 and USGS, 2006): 46-48

Notes:
[1] Location datum is NAD 27

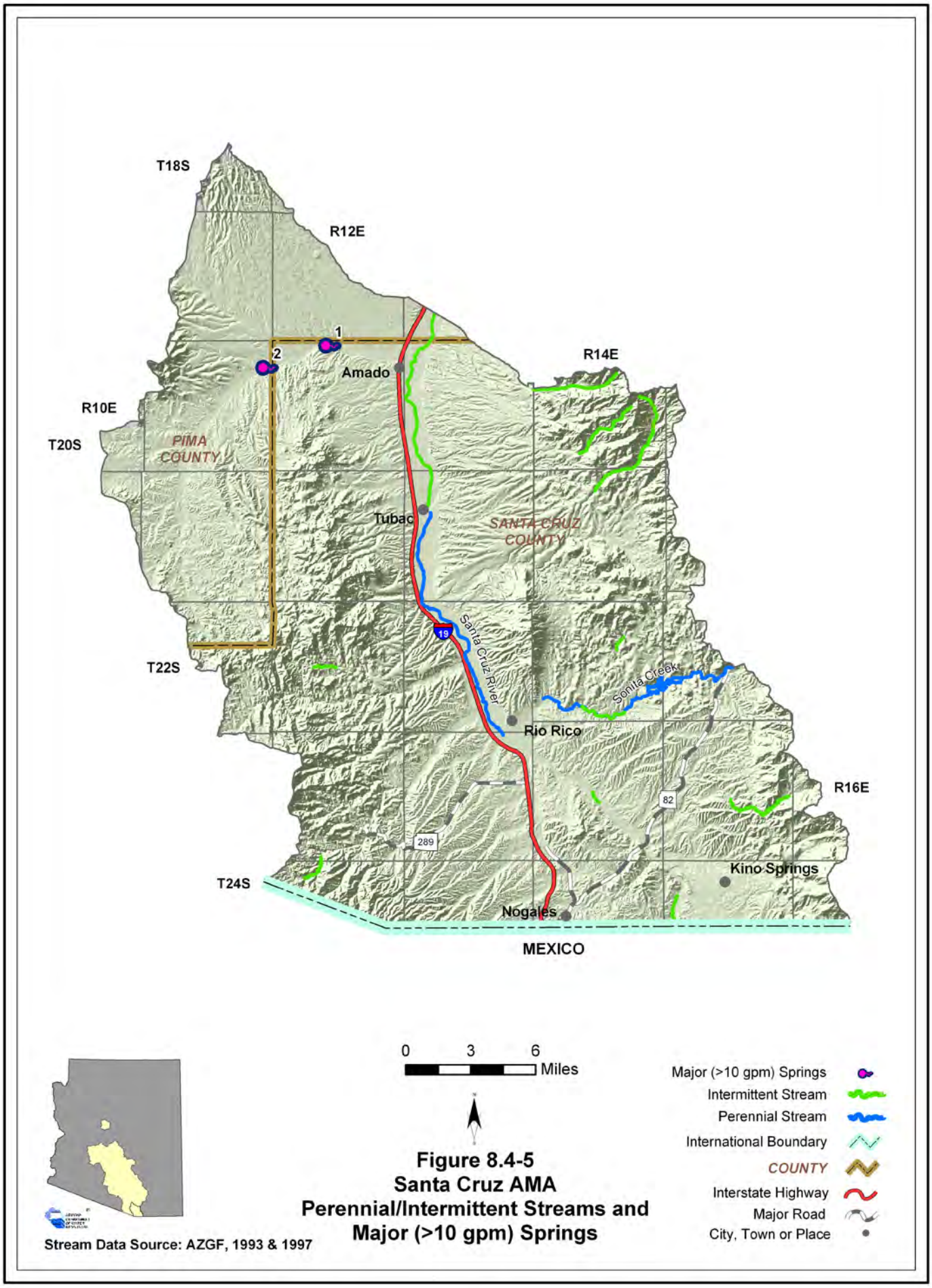


Figure 8.4-5
Santa Cruz AMA
Perennial/Intermittent Streams and Major (>10 gpm) Springs

8.4.6 Groundwater Conditions of the Santa Cruz AMA

Major aquifers, well yields, estimated natural recharge, number of index wells and date of last water-level sweep are shown in Table 8.4-6. Figure 8.4-6 shows aquifer flow direction and water-level change between 1995 and 2004-2005. Figure 8.4-7 contains hydrographs for selected wells shown on Figures 8.4-6. Figure 8.4-8 shows well yields in five yield categories. There are no Underground Storage Facilities (USFs) in the Santa Cruz AMA. A description of aquifer data sources and methods is found in Volume 1, Section 1.3.2. A description of well data sources and methods, including water-level changes and well yields, is found in Volume 1, Section 1.3.19.

Major Aquifers

- Refer to Table 8.4-6 and Figure 8.4-6
- The major aquifers in this AMA are recent stream alluvium and basin fill.
- Groundwater flow is to the north, toward and along the Santa Cruz River drainage.
- Groundwater is stored in smaller, fault delimited micro-basins.

Well Yields

- Refer to Table 8.4-6 and Figure 8.4-8
- One source of well yield information, based on 115 reported wells, indicates that the median well yield is 800 gpm.
- Well yields are typically higher in the recent stream alluvium and lower in the basin fill.

Natural Recharge

- Refer to Table 8.4-6
- Natural recharge in the Santa Cruz AMA is estimated at 61,050 acre-feet per year.
- Sources of natural recharge include infiltration from the Santa Cruz River, mountain front recharge and groundwater inflow from the south.

Water Level

- Refer to Figure 8.4-6. Water levels are shown for wells measured in 2004-2005.
- The Department annually measures 52 index wells in the AMA; hydrographs for five index wells are shown on Figure 8.4-7.
- The deepest and shallowest water levels shown are along Highway 289 at 323 feet and two feet, respectively.

Table 8.4-6 Groundwater Data for the Santa Cruz AMA

Basin Area, in square miles:	716	
Major Aquifer(s):	**Name and/or Geologic Units**	
	Recent Stream Alluvium	
	Basin Fill	
Well Yields, in gal/min:	Range 3.6-4,083 Median 628 (97 wells measured)	ADWR GWSI
	Range 1-5,400 Median 800 (115 wells reported)	ADWR Wells55 (>10-inch diameter)
Estimated Natural Recharge, in acre-feet/year:	61,050	ADWR Santa Cruz TMP
Current Number of Index Wells:	52	
Date of Last Water-level Sweep:	2005 (188 well measurements)	

TMP = Third Management Plan

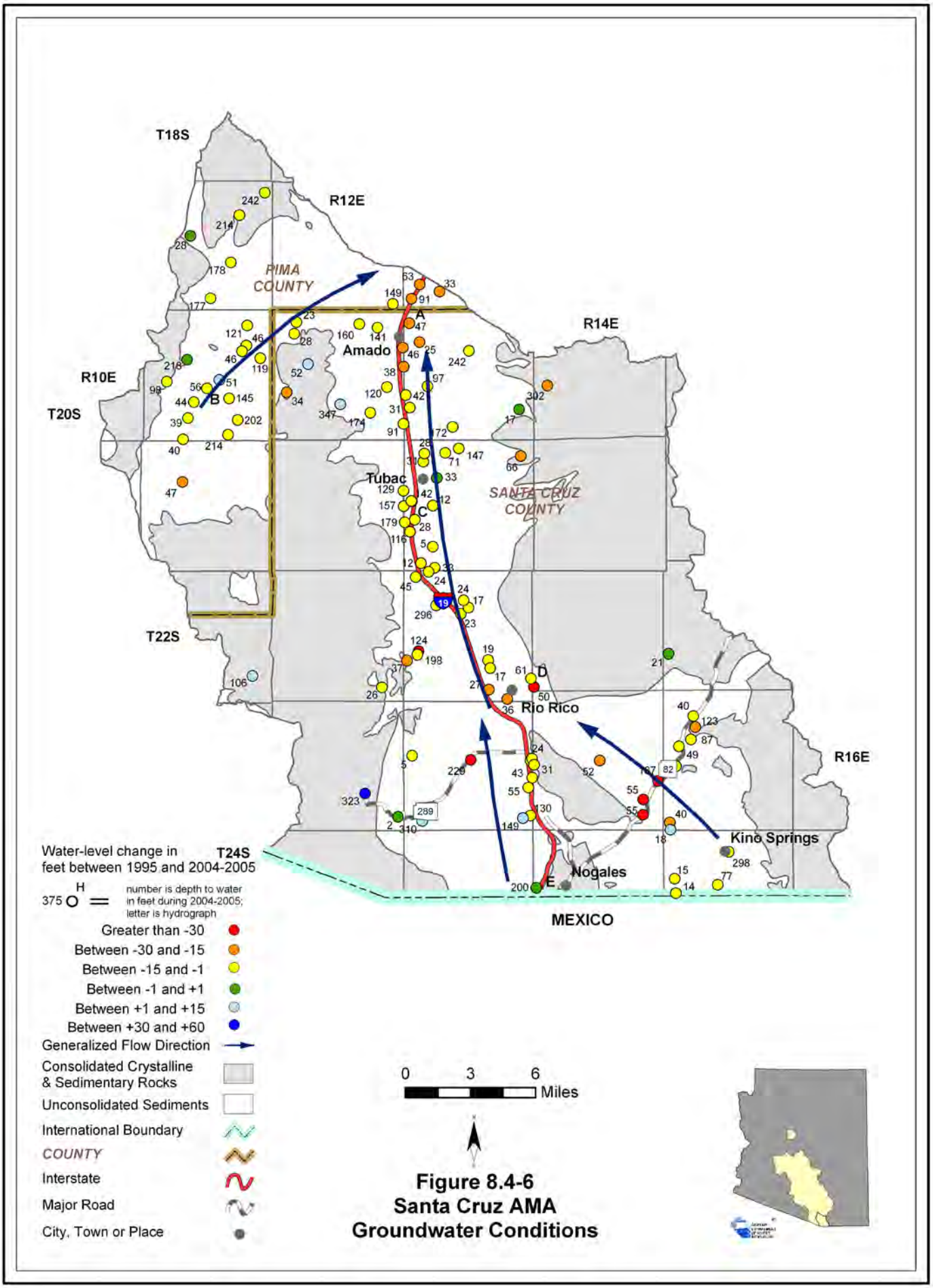


Figure 8.4-6
Santa Cruz AMA
Groundwater Conditions

Figure 8.4-7
Santa Cruz Active Management Area
Hydrographs Showing Depth to Water in Selected Wells

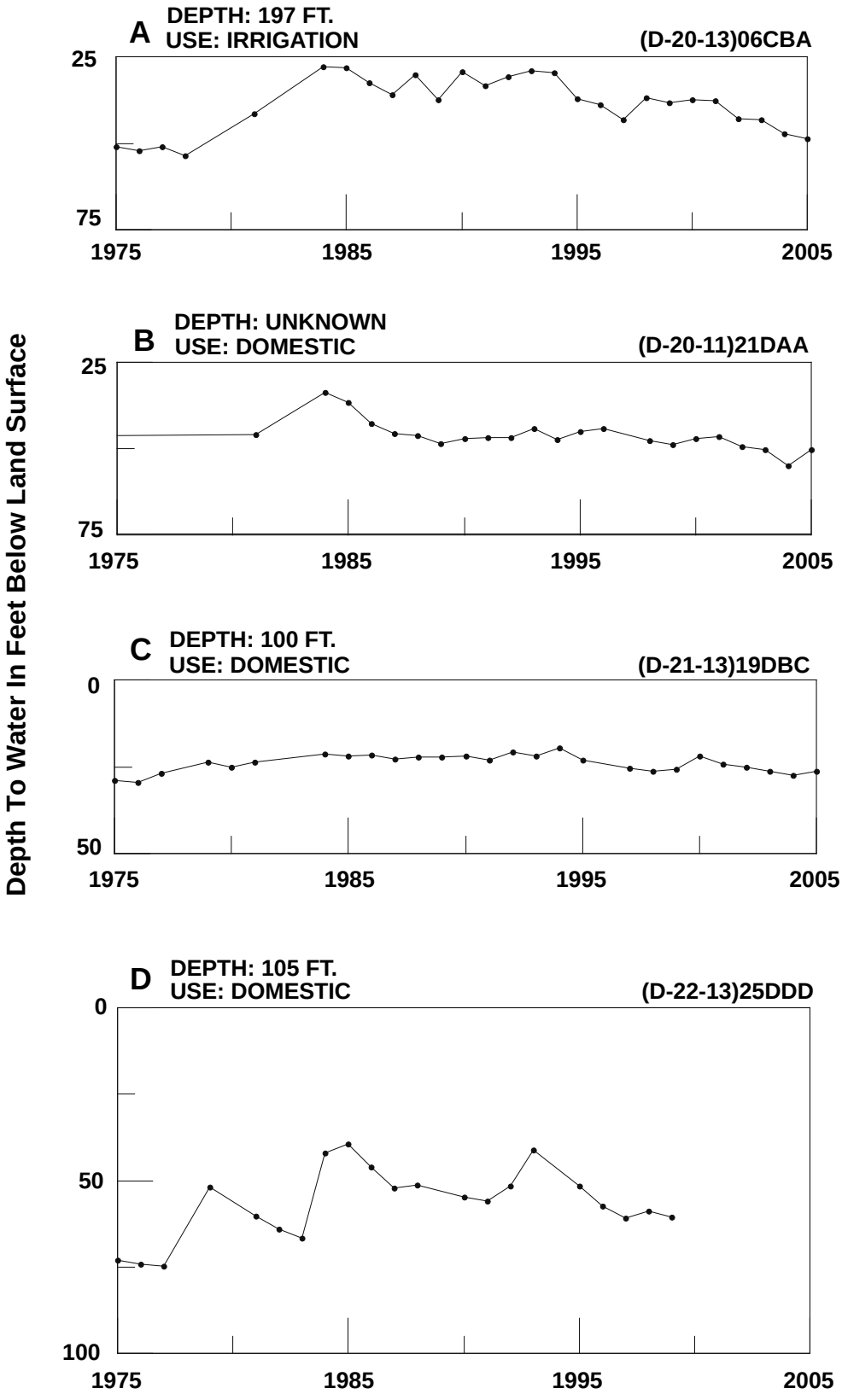
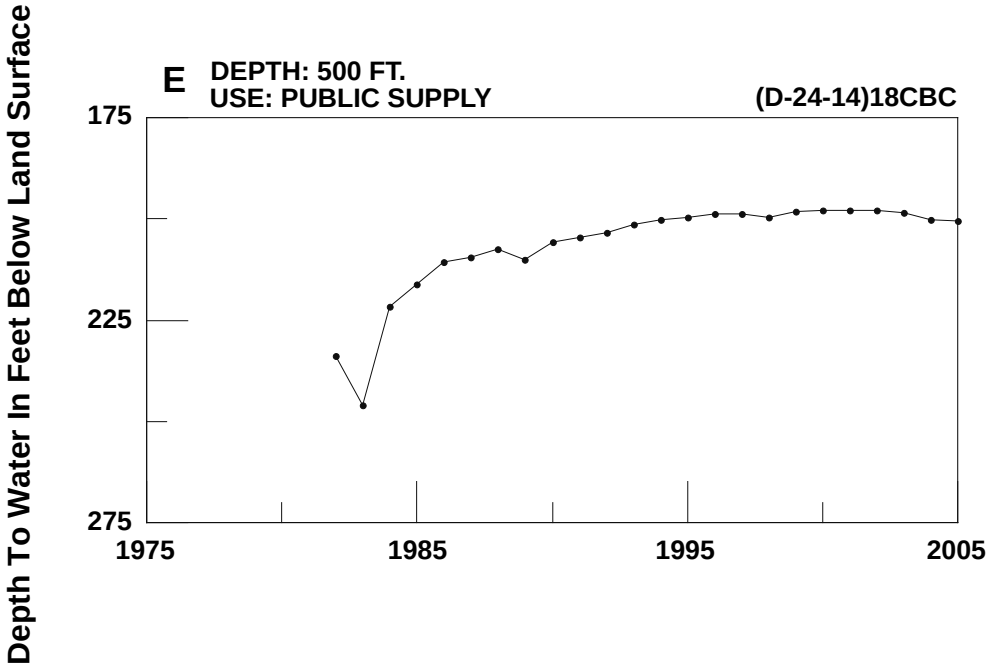


Figure 8.4-7 (cont)
Santa Cruz Active Management Area
Hydrographs Showing Depth to Water in Selected Wells



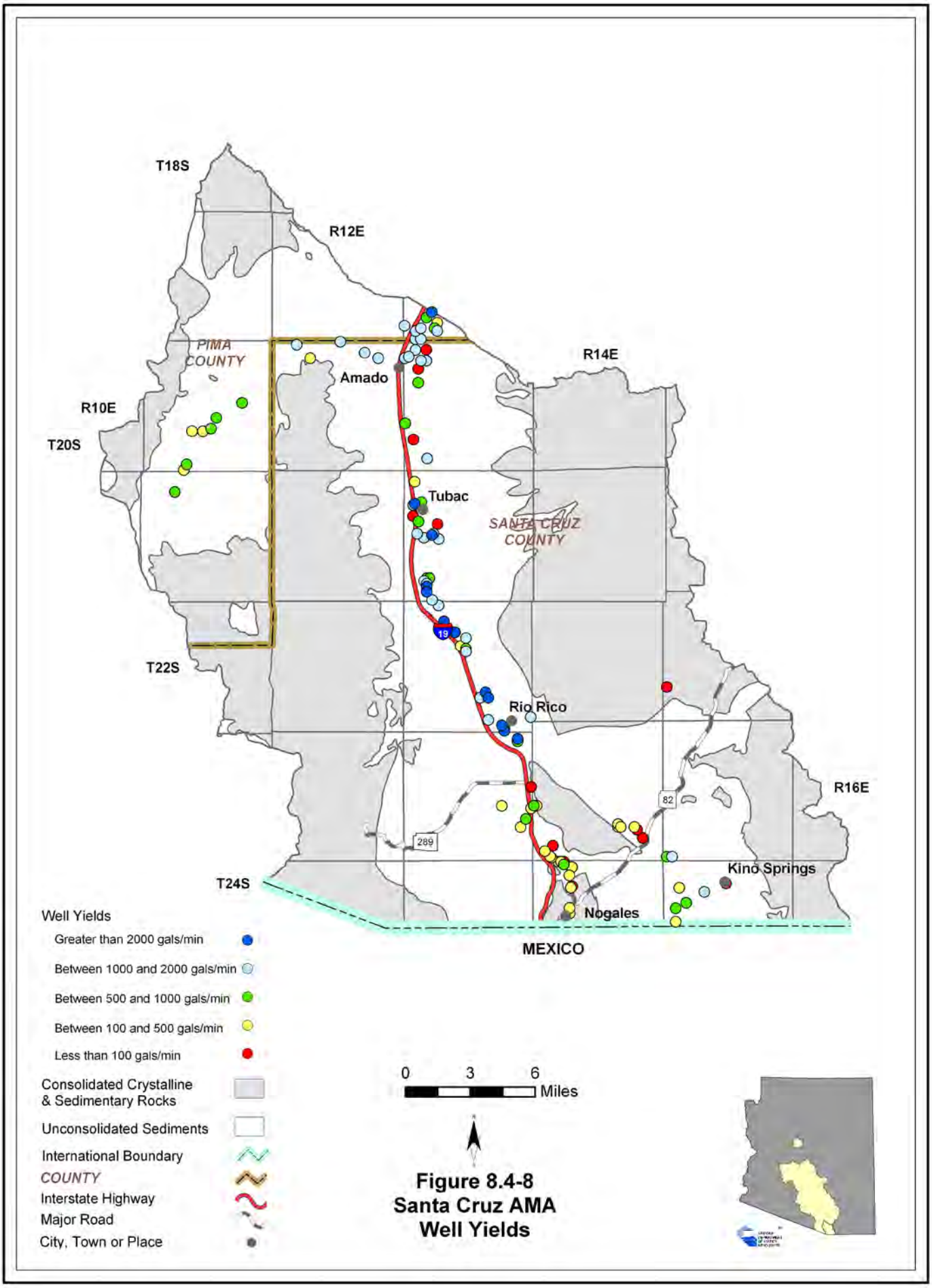


Figure 8.4-8
Santa Cruz AMA
Well Yields

8.4.7 Water Quality Exceedences and Contamination Sites in the Santa Cruz AMA

Sites with parameter concentrations that have equaled or exceeded drinking water standard(s) (DWS), including location and parameter(s) are shown in Table 8.4-7A. Impaired lakes and streams with site type, name, length of impaired reach, area of impaired lake, designated use standard and parameter(s) exceeded is shown in Table 8.4-7B. Figure 8.4-9 shows the location of water quality occurrences keyed to Table 8.4-7. Figure 8.4-10 shows the located of contamination sites in the Santa Cruz AMA with site information in Table 8.4-8. A description of water quality data sources and methods is found in Volume 1, Section 1.3.18. Not all parameters were measured at all sites; selective sampling for particular constituents is common.

Well, mine and spring sites that have equaled or exceeded drinking water standards (DWS)

- Refer to Table 8.4-7A.
- Forty-five sites have parameter concentrations that have equaled or exceeded DWS.
- The most frequently equaled or exceeded parameters are organics and arsenic.
- Other parameters equaled or exceeded include mercury, manganese, fluoride, lead, radionuclides, selenium and nitrates.

Lakes and Streams with impaired waters

- Refer to Table 8.4-7B.
- Water quality standards were equaled or exceeded in three stream reaches and one lake. The parameters most commonly equaled or exceeded were copper and E. coli.
- One reach, Three R Canyon - headwaters to ephemeral segment, and one lake, Pena Blanca Lake, are part of the ADEQ water quality improvement effort called the Total Maximum Daily Load (TMDL) Program. The final TMDL document has been completed for both.

Effluent Dependent Reaches

- Refer to Figure 8.4-9
- A portion of the Santa Cruz River in this AMA is effluent dependent.

Contamination Sites

- Refer to Figure 8.4-10 and Table 8.4-8
- There are two contamination sites in the AMA in the vicinity of Nogales.

Table 8.4-7 Water Quality Exceedences in the Santa Cruz AMA[1]

A. Wells, Springs and Mines

Map Key(s)	Location			Number of Stations	Parameter(s) Concentration has Equaled or Exceeded Drinking Water Standard (DWS)[2]
	Township	Range	Section		
1	19 South	13 East	29	2	Organics, Pb
2	20 South	13 East	31	1	As
3	21 South	12 East	13	1	As
4	21 South	13 East	19	1	As
5	21 South	13 East	30	1	As
6	21 South	14 East	30	1	Hg
7	22 South	11 East	3	1	Rad
8	22 South	13 East	9	1	Mn
9	22 South	13 East	34	1	Mn, NO3
12	23 South	12 East	26	1	F
10	23 South	13 East	1	1	Pb
11, 13	23 South	14 East	19	2	NO3
13, 14	23 South	13 East	25	6	Mn, Organics
13	23 South	14 East	30	4	F, Mn, NO3, Organics
14, 16	23 South	13 East	36	6	F, Mn, NO3, Organics, Pb
15	23 South	14 East	31	4	As, Organics, Se
17	24 South	14 East	5	2	As, Organics
18	24 South	14 East	8	1	As
19	24 South	14 East	16	1	As, Mn, Pb
19, 20	24 South	14 East	17	6	As, Mn, Organics, Pb
20	24 South	14 East	20	1	Organics

B. Lakes and Streams

Map Key	Site Type	Site Name	Length of Impaired Stream Reach (in miles)	Area of Impaired Lake (in acres)	Designated Use Standard[3]	Parameter(s) Exceeding Use Standard[2]
a	Stream	Three R Canyon-headwaters to ephemeral segment	2.3	NA	A&W, PBC, Agl	Cd, Cu, Zn, pH
b	Stream	Santa Cruz River - Mexican border to Nogales WWTP outfall	17	NA	FBC	E. Coli
c	Stream	Nogales Wash - Mexico border to Santa Cruz River	6.2	NA	A&W, PBC	E. Coli, Cu, Cl
d	Lake	Pena Blanca Lake	NA	50	FC	Hg

Notes:

[1] Water quality samples collected between 1975 and 2004.

[2] As = Arsenic
Cd = Cadmium
Cl = Chlorine
Cu = Copper
F = Fluoride
Hg = Mercury
Mn = Manganese
Pb = Lead
pH = Measurement of acidity or alkalinity
NO3 = Nitrate/ Nitrite
Organics = One or more of several volatile and semi-volatile organic compounds and pesticides
Rad = radionuclides
Se = Selenium
Zn = Zinc

[3] A&W = Aquatic and Wildlife
Agl = Agriculture
FC = Fish Consumption
FBC= Full Body Contact
PBC = Partial Body Contact

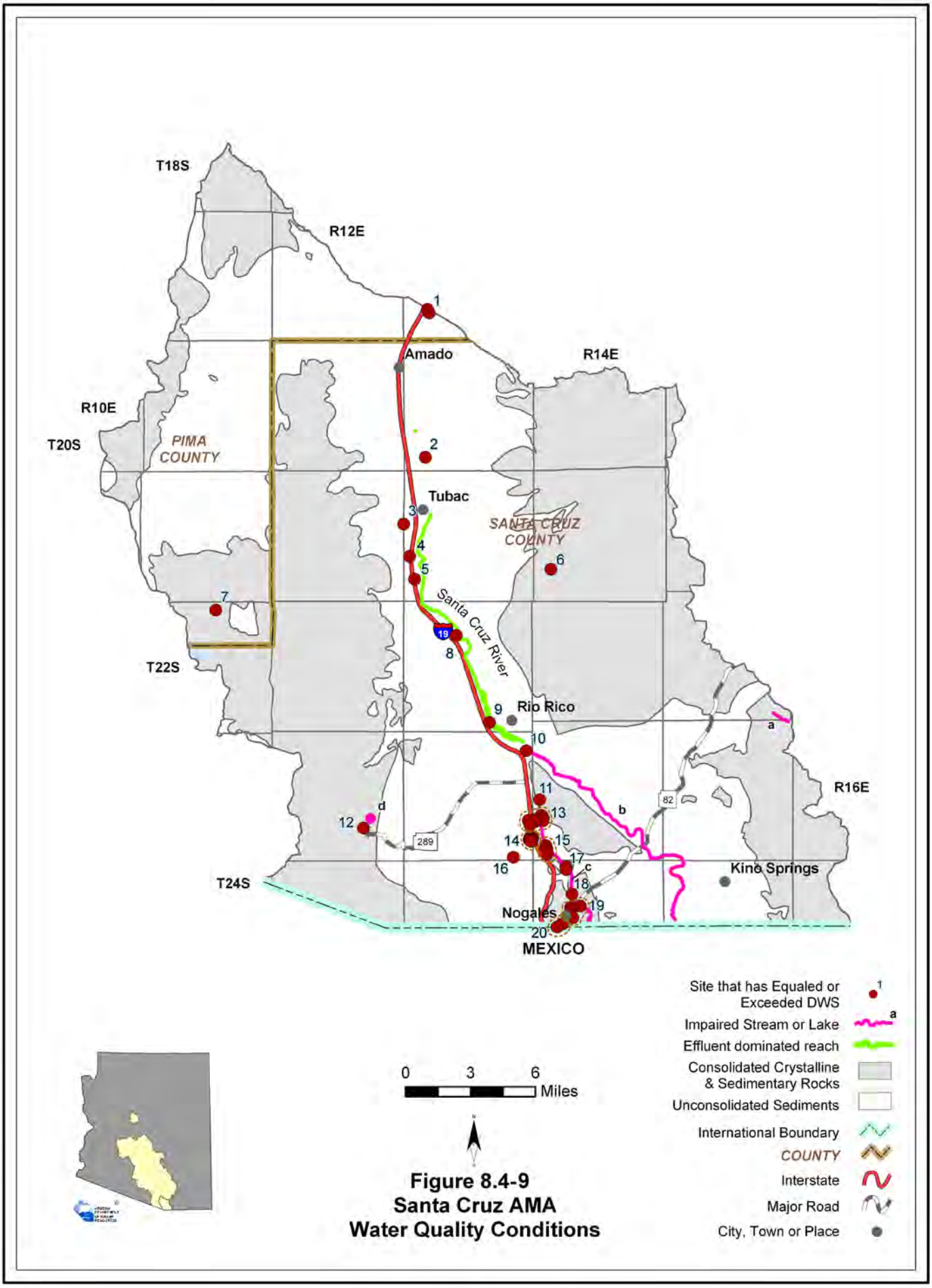


Figure 8.4-9
Santa Cruz AMA
Water Quality Conditions

Table 8.4-8 Contamination Sites in the Santa Cruz AMA

SITE NAME	MEDIA AFFECTED AND CONTAMINANT
Voluntary Remediation Sites	
Valencia Power Plant	Soil & Groundwater/Volitile Organic Compounds (VOCs) and Chromium
Resource Conservation and Recovery Sites	
United Musical	Groundwater/Volitile Organic Compounds (VOCs)

NA - Not Available
Sources: ADEQ 2002, ADEQ 2006a, ADEQ 2006b

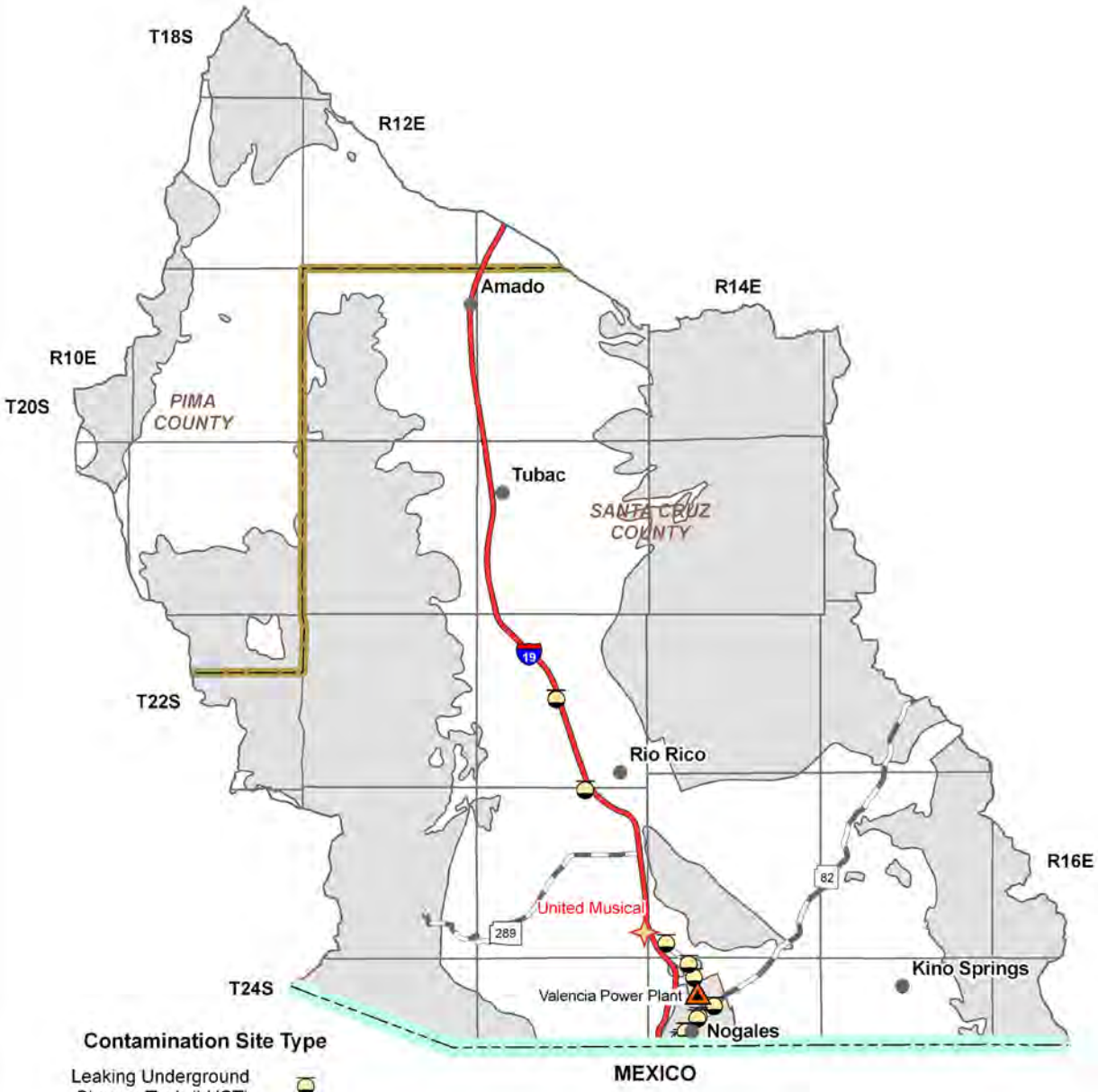


Figure 8.4-10
Santa Cruz AMA
Contamination Sites

8.4.8 Cultural Water Demands in the Santa Cruz AMA

Cultural water demand data including population, number of wells and the average well pumpage and non-groundwater use by the municipal, industrial and agricultural sectors are shown in Table 8.4-9. Effluent generation including facility ownership, location, population served and not served, volume treated, disposal method and treatment level is shown in Table 8.4-10. Figure 8.4-11 shows the location of demand centers. A description of cultural water demand data sources and methods is found in Volume 1, Section 1.3.5. More detailed information on cultural water demands is found in Section 8.0.7.

Cultural Water Demands

- Refer to Table 8.4-9 and Figure 8.4-11.
- Population in this AMA increased from 20,290 in 1980 to 37,049 in 2000 and projections suggest an increase to over 80,700 residents by 2050.
- Total average annual water use in the Santa Cruz AMA has increased slightly since the early 1990s; however, the proportional use by the 3 major demand sectors have stayed relatively constant.
- In 2001-2003 agricultural water demand accounted for approximately 59% of the total annual water demand, the municipal sector accounts for 35% and the industrial sector approximately 6%.
- Coordinated management of groundwater and surface water is practiced in the Santa Cruz AMA and use of non-groundwater supplies have not been separately reported.
- As of 2003 there were 1,117 registered wells with a pumping capacity of less than or equal to 35 gallons per minute and 589 wells with a pumping capacity of more than 35 gallons per minute.

Effluent Generation

- Refer to Table 8.4-10.
- Six wastewater treatment facilities were identified in the AMA.
- A variety of effluent disposal methods are used in the AMA but most is disposed of by discharge into the Santa Cruz River.
- More than 16,300 acre-feet of effluent is treated/generated annually in the AMA.

Table 8.4-9 Cultural Water Demands in the Santa Cruz AMA[1]

Year	Recent (Census) and Projected (DES) Population	Number of Registered Water Supply Wells Drilled		Average Annual Demand (in acre-feet)[2]						Data Source
				Well Pumpage			Non-Groundwater[3]			
		Q ≤ 35 gpm	Q > 35 gpm	Municipal	Industrial	Irrigation[4]	Municipal	Industrial	Irrigation[4]	
1971		695[5]	277[5]	NR			NR			ADWR[6] (1994)
1972										
1973										
1974										
1975										
1976				NR			NR			
1977										
1978										
1979										
1980	20,290									
1981	21,112	75	35	NR			NR			
1982	21,933									
1983	22,755									
1984	23,576									
1985	24,398									
1986	25,220	76	60	20,300			NR			ADWR (2008)
1987	26,041									
1988	26,863									
1989	27,684									
1990	28,506									
1991	29,360	89	93	7,100	1,300	11,400	NR	NR	NR	
1992	30,215									
1993	31,069									
1994	31,923									
1995	32,778									
1996	33,632	124	93	7,900	1,500	13,500	NR	NR	NR	
1997	34,486									
1998	35,340									
1999	36,195									
2000	37,049									
2001	38,138	58	31	8,300	1,500	14,000	NR	NR	NR	
2002	39,226									
2003	40,315									
2010	47,934									
2020	58,817									
2030	67,735									
2040	74,871									
2050	80,763									
ADDITIONAL WELLS:[7]		**17**	**0**							
WELL TOTALS:		**1,134**	**589**							

Notes:
NR = Not reported.
[1] Does not include evaporation losses from stockponds and reservoirs.
[2] Includes Indian Demand
[3] Within the Santa Cruz AMA, water is not separately defined as surface water or groundwater so all volumes are reported under well pumpage.
[4] Agricultural demand does not include small exempt use after 1993.
[5] Includes all wells through 1980.
[6] Until 1994 the Santa Cruz AMA was part of the Tucson AMA. Water demand for the Santa Cruz AMA between 1971-1985 is included on Table 8.5-10, Tucson AMA Cultural Water Demand.
[7] Other water-supply wells are listed in the ADWR Well Registry for this basin, but they do not have completion dates or application dates. These wells are summed here.

Table 8.4-10 Effluent Generation in the Santa Cruz AMA

Facility Name	Ownership	City/Location Served	Population Served	Volume Treated/Generated (acre-feet)	Disposal Method									Current Treatment Level	Population Not Served	Year of Record
					Water - course	Evaporation Pond	Irrigation	Golf Course	Wildlife Area	Discharged to Another Facility	Infiltration Basin	Industrial Reuse	Other			
Arivaca Junction WWTF	Pima County	Arivaca Junction	840	68		X					X		X	Secondary	NA	2004
Kino Springs WWTF	City of Nogales	Nogales	176	22							X			Secondary	NA	2004
La Entrada De Tubac Plaza	Private	Tubac Plaza	NA	NA	NA									NA	NA	NA
Madera Canyon	NA	Madera Canyon	161	NA			X							NA	NA	NA
Nogales International WWTP	City of Nogales/IWBC	Noglaes	21,000[1]	16,221[2]	X									Secondary	NA	2004
Tubac WWTF	Private	Tubac	1,710	NA									X	NA	NA	NA
Total			**23,887**	**16,311**												

Sources: Clean Water Needs Survey (CWNS) 2002 and 2004 Data, ADEQ's AZURITE Facility website, Nogales International WWTP data (2008)

[1] Population Served above for Nogales International WWTP is the US portion only, 2004 estimate of Non-US residents served exceeds 367,000.

[2] Total volume generated from WWTP, includes both US and Non-US portions

IBWC = International Boundary and Water Commission
WWTF=Wastewater Treatment Facility
WWTP=Wastewater Treatment Plant
NA=not available

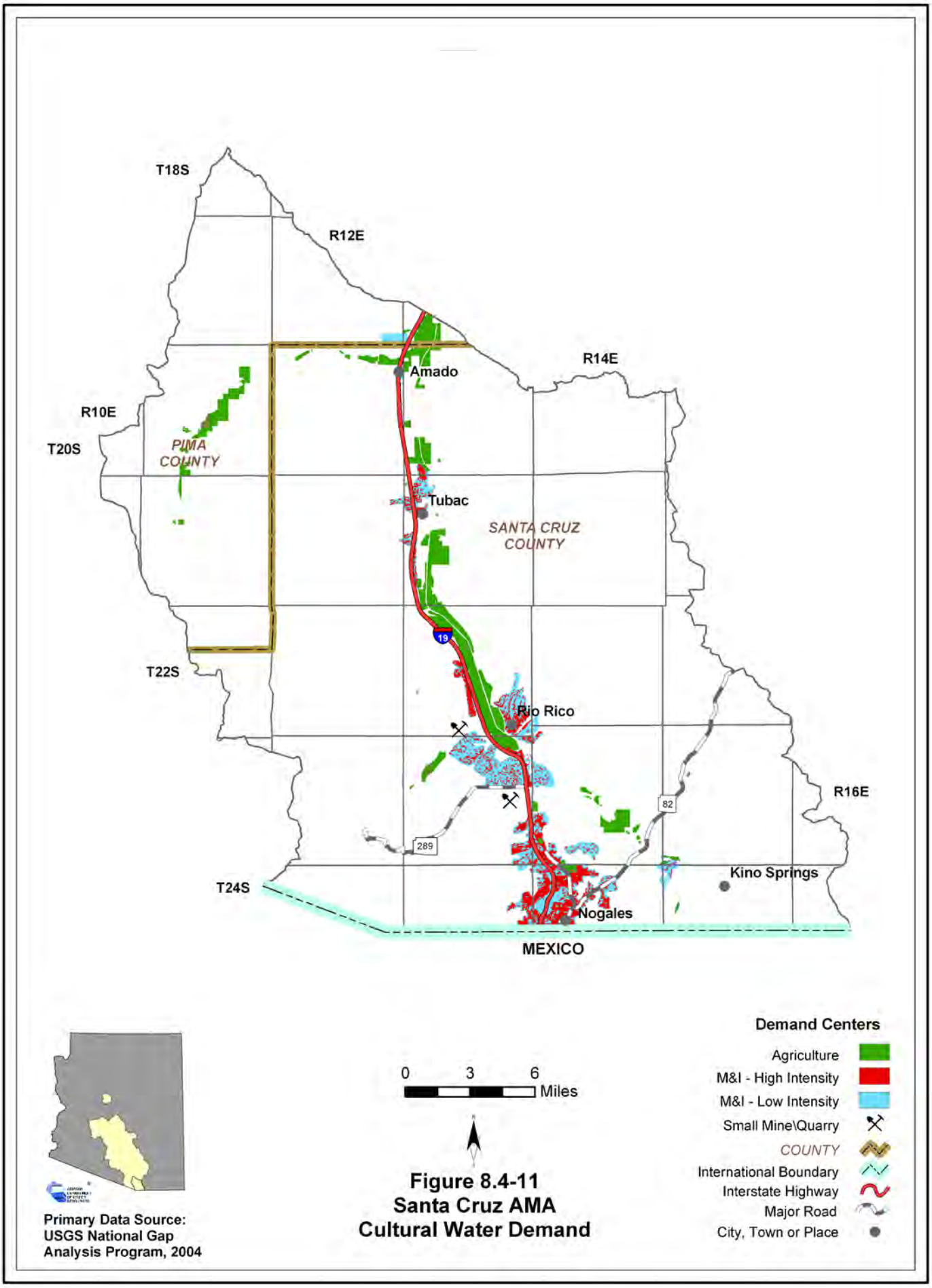


Figure 8.4-11
Santa Cruz AMA
Cultural Water Demand

8.4.9 Assured Water Supply Determinations in the Santa Cruz AMA

Assured water supply determination information including the subdivision name, location, number of lots, date of determination and subdivision water provider are shown in Table 8.4-11A, B and C for certificates, water adequacy reports and analysis of assured water supply. Designated water provider information is shown in Table 8.4-11D with date of application, date the designation was issued and projected or annual estimated demand. Figure 8.4-12 shows the general locations of subdivisions (to the section level) and designated provider water service areas keyed to the Table. A description of the Assured Water Supply Program is found Section 8.0.5 and in Volume 1, Appendix A. Assured Water Supply determination data sources and methods are found in Volume 1, Sections 1.3.1.

Water Supply Records

- See Table 8.4-11
- As of February 2008, 77 subdivisions with a total of 18,952 lots have been reviewed for an assured water supply determination. All but one of the determinations were in Santa Cruz County.
- 3,707 lots in 39 subdivisions received a Certificate of Assured Water Supply, 1,491 lots in 32 subdivisions received Water Adequacy Reports and 13,754 lots in six developments received an Analyses of Assured Water Supply.
- There are two designated providers, City of Nogales and Baca Float Water Company, Inc, with a total projected or estimated annual water use of 6,655 acre-feet.

Table 8.4-11 Assured Water Supply Determinations in the Santa Cruz AMA[1]

A. Certificates of Assured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
2	Lakewood Estates Lots 118-150	Pima	19 South	12 East	36	33	27-200175	04/06/83	Lakewood Water Company
3	Rio Cruz	Santa Cruz	20 South	13 East	31	21	27-400781	06/30/03	Arizona American Water Company - Tubac
4	Vistas at Sopori Ranch	Santa Cruz	21 South	12 East	1 & 11	322	27-500082	12/18/07	Sopori Domestic Water Improvement District
6	The Ranch at Aliso Springs, Lots 1-25	Santa Cruz	21 South	12 East	24	25	27-401280	12/23/04	Dry lot
7	Cerro Pelon	Santa Cruz	21 South	12 East	12	23	27-200047	02/07/94	Tubac Valley Water Company
7	Silver Spur Ranchettes	Santa Cruz	21 South	12 East	12	6	27-200314	08/06/98	Tubac Valley Water Company
8	Barrio de Tubac Phase I	Santa Cruz	21 South	13 East	7 & 18	141	27-300303	08/15/97	Baca Float Water Company, Inc.
8	San Miguel Patio Homes Phases II and III	Santa Cruz	21 South	13 East	18	9	27-401068	10/22/03	Baca Float Water Company, Inc.
8	Cielito Lindo de Tubac Phase II	Santa Cruz	21 South	13 East	18	31	27-401069	10/22/03	Baca Float Water Company, Inc.
8	Santiago at Barrio de Tubac Phase II	Santa Cruz	21 South	13 East	18	37	27-401070	10/22/03	Baca Float Water Company, Inc.
9	Palo Parada Estates	Santa Cruz	21 South	13 East	7	10	27-200215	06/16/92	Arizona American Water Company - Tubac
10	Estates de Anza	Santa Cruz	21 South	13 East	6	18	27-500038	03/22/07	Arizona American Water Company - Tubac
11	Tubac Valley C.C. Fairway Est. (1992)	Santa Cruz	21 South	13 East	5, 6 & 7	10	27-200359	05/28/92	Arizona American Water Company - Tubac
11	Tubac Golf Resort Development	Santa Cruz	21 South	13 East	6, 7 & 8	229	27-401104	03/07/05	Arizona American Water Company - Tubac
12	Tubac Ranch Properties Lmtd	Santa Cruz	21 South	13 East	5 & 6	111	27-200357	03/07/95	Arizona American Water Company - Tubac
13	Tubac Valley C.C. Fairway Est. (1984)	Santa Cruz	21 South	13 East	5 & 6	111	27-200358	04/19/84	Arizona American Water Company - Tubac
13	Tubac Golf Resort Homes Lots 1-60	Santa Cruz	21 South	13 East	5 & 6	60	27-400929	06/26/03	Arizona American Water Company - Tubac
15	Tubac 40	Santa Cruz	21 South	13 East	6	85	27-500085	03/19/07	Arizona American Water Company - Tubac
16	Palo Parado Hills	Santa Cruz	22 South	13 East	7, 8, 17 & 18	16	27-200216	02/05/85	Dry lot
21	Calabasas Rio Rico Unit 4, Lots 1-348 and a portion of Lot C	Santa Cruz	22 South	13 East	2, 3, 10 & 11	348	27-700357	09/06/07	Rio Rico Utilities
21	Rio Rico Unit 4, Lots A, B, D, F and a portion of Lot C	Santa Cruz	22 South	13 East	2, 3, 10 & 11	100	27-700358	09/06/07	Rio Rico Utilities
25	Rio Rico Villas Unit 5	Santa Cruz	22 South	13 East	24 & 25	1090	27-300331	04/28/99	Rio Rico Utilities
28	Rio Rico Ranchettes Unit 16	Santa Cruz	22 South	14 East	31, 32 & 33	259	27-300336	04/28/99	Rio Rico Utilities
29	Lake Patagonia Ranch	Santa Cruz	22 South	14 East	36	NA	27-200165	07/06/83	Dry lot
29	Lake Patagonia Ranch	Santa Cruz	22 South	14 East	36	NA	27-200169	01/25/89	Dry lot
30	Sonoita Creek Ranch	Santa Cruz	22 South	14 East	1, 2, 5, 6, 31 & 36	NA	27-200315	06/24/83	Dry lot
31	Lake Patagonia Ranch	Santa Cruz	22 South	15 East	31	NA	27-200166	07/06/83	Dry lot
31	Lake Patagonia Ranch	Santa Cruz	22 South	15 East	31	NA	27-200170	01/25/89	Dry lot
35	Pena Blanca Highlands	Santa Cruz	23 South	13 East	13, 24 & 25	127	27-200225	05/16/91	Valle Verde Water Co.
36	Coronado Estates	Santa Cruz	23 South	13 East	24 & 25	41	27-400934	07/28/03	Valle Verde Water Co.
37	Las Colinas Sagradas, Phase 1	Santa Cruz	23 South	13 East	24 & 25	264	27-700425	01/24/08	Valle Verde Water Co.
39	Las Minas Estates	Santa Cruz	23 South	13 East	25	NA	27-200176	09/10/81	Valle Verde Water Co.
39	Las Minas Estates	Santa Cruz	23 South	13 East	25	133	27-200177	06/10/82	Valle Verde Water Co.
39	Lopez Industrial Park	Santa Cruz	23 South	13 East	25	12	27-200185	04/10/86	Valle Verde Water Co.
48	Lake Patagonia Ranch	Santa Cruz	23 South	14 East	1 & 2	NA	27-200167	07/06/83	Dry lot
49	Lake Patagonia Ranch	Santa Cruz	23 South	14 East	1 & 2	NA	27-200171	01/25/89	Dry lot
50	Lake Patagonia Ranch	Santa Cruz	23 South	15 East	5 & 6	NA	27-200168	07/06/83	Dry lot
50	Lake Patagonia Ranch	Santa Cruz	23 South	15 East	5 & 6	NA	27-200172	01/25/89	Dry lot
51	Lake Patagonia Ranch #6B	Santa Cruz	23 South	15 East	5	35	27-200173	04/08/93	Dry lot

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application[3]
			Township	Range	Section					
3	Tubac Valley Villas	Santa Cruz	20 South	13 East	31	33	53-501582	Adequate	03/13/74	Arizona American Water Company - Tubac
7	Empty Saddle Estates	Santa Cruz	21 South	12 East	12	22	53-500613	Adequate	10/25/77	Arizona American Water Company - Tubac
10	Calle del Ayer	Santa Cruz	21 South	13 East	6	7	53-500377	Adequate	07/10/74	Tubac Valley Water Company
14	Rio Rico Villas Unit 14, lots 2, 20 & 53	Santa Cruz	21 South; 22 South	13 East; 14 East	32 & 33; 4 & 5	3	53-700379	Inadequate	07/27/07	Rio Rico Utilities
17	Ranchos Del Rio	Santa Cruz	22 South	13 East	9	55	53-401467	Inadequate	09/24/04	Rio Rico Utilities
18	Los Altos Subdivision	Santa Cruz	22 South	13 East	16	9	53-401465	Inadequate	09/02/04	Rio Rico Utilities

Table 8.4-11 Assured Water Supply Determinations in the Santa Cruz AMA[1]

B. Water Adequacy Reports

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	ADWR Adequacy Determination[2]	Date of Determination	Water Provider at the Time of Application[3]
			Township	Range	Section					
19	Rio Rico Villas #13	Santa Cruz	22 South	13 East	21, 22, 27, 28 & 34	298	53-501309	Inadequate	10/05/83	Rio Rico Utilities
20	Bella Vista North, Lots 109-121, 125-140, 174-227 & C.A.s "L" - "P"	Santa Cruz	22 South	13 East	34	83	53-401800	Inadequate	08/03/05	Rio Rico Utilities
22	Rio Rico Ranchettes #3	Santa Cruz	22 South	13 East	23, 24, 25 & 36	103	53-501308	Inadequate	10/05/83	Rio Rico Utilities
22	Rio Rico Ranchettes Unit 3, #4/Unit 10	Santa Cruz	22 South	13 East	23	7	53-400091	Inadequate	06/14/99	Rio Rico Utilities
23	Rio Rico Estates #3	Santa Cruz	22 South	13 East	25, 26, 35 & 36	49	53-501307	Inadequate	10/05/83	Rio Rico Utilities
24	Piedras Blancas	Santa Cruz	22 South	13 East	13	37	53-401295	Inadequate	04/26/04	Rio Rico Utilities
26	Rio Rico Estates Unit 10	Santa Cruz	22 South	13 East	35 & 36	8	53-401735	Inadequate	08/11/05	Rio Rico Utilities
27	Rio Rico Ranchettes Unit 18	Santa Cruz	22 South	14 East	31	4	53-700235	Adequate	02/15/07	Dry lot
32	Rio Rico Resort Terrace	Santa Cruz	23 South	13 East	3	199	53-700307	Inadequate	04/18/07	Rio Rico Utilities
33	Bella Vista Unit 7	Santa Cruz	23 South	13 East	2 & 3	118	53-400361	Inadequate	07/19/00	Rio Rico Utilities
33	Bella Vista North / Bella Vista III	Santa Cruz	23 South	13 East	2 & 3	234	53-401296	Inadequate	05/18/04	Rio Rico Utilities
34	Casitas De Anza	Santa Cruz	23 South	13 East	35	11	53-401527	Inadequate	11/03/04	Rio Rico Utilities
40	Meadow Hills Estates	Santa Cruz	23 South	13 East	36	35	53-500945	Adequate	09/17/73	Potrero Water Company
41	Rio Rico Estates Unit 10	Santa Cruz	23 South	13 East	1	8	53-401735	Inadequate	08/11/05	Rio Rico Utilities
42	Rio Rico Estates Unit 10	Santa Cruz	23 South	14 East	5, 6 & 7	8	53-401735	Inadequate	08/11/05	Rio Rico Utilities
43	Los Alamos	Santa Cruz	23 South	14 East	19	7	53-500915	Adequate	01/20/75	Valle Verde Water Co.
43	Estancias Rio Vista	Santa Cruz	23 South	14 East	19	12	53-401528	Inadequate	11/04/04	Rio Rico Utilities
44	Valle Verde #10	Santa Cruz	23 South	14 East	31	12	53-501595	Adequate	09/15/75	Valle Verde Water Co.
44	Mi Casa	Santa Cruz	23 South	14 East	31	47	53-500974	Adequate	09/22/76	Valle Verde Water Co.
44	Batiz Park	Santa Cruz	23 South	14 East	31	19	53-500308	Adequate	09/22/76	Valle Verde Water Co.
45	Los Robles	Santa Cruz	23 South	14 East	5	6	53-500929	Adequate	08/22/79	Valle Verde Water Co.
45	Rio Rico Ranchettes Unit II	Santa Cruz	23 South	14 East	5-8 & 17	7	53-400481	Inadequate	03/26/01	Rio Rico Utilities
46	River View Estates	Santa Cruz	23 South	14 East	17	9	53-401468	Inadequate	09/24/04	Rio Rico Utilities
47	Camino Cumbre	Santa Cruz	23 South	14 East	3 & 4	7	53-400950	Inadequate	06/02/03	Rio Rico Utilities
52	Buena Vista Mobile Home Park	Santa Cruz	24 South	15 East	18	0	53-500367	Adequate	07/30/84	Buena Vista Public Service
52	Buena Vista Mobile Estates	Santa Cruz	24 South	15 East	7 & 18	34	53-500366	Adequate	01/21/81	Buena Vista Public Service

C. Analyses ofAssured Water Supply

Map Key	Subdivision Name	County	Location			No. of Lots	ADWR File No.	Date of Determination	Water Provider at the Time of Application
			Township	Range	Section				
1	Sopori Ranch	Santa Cruz	19 South; 20 South; 20 South; 20 South; 21 South	12 East; 11 East; 12 East; 13 East; 11 East	33 & 34; 11-15, 22, 27 & 33-35; 1-9, 12, 13, 18, 23-25, 28, 30, 31 & 33; 31; 4, 5, 8 & 9	9150	28-700267	04/20/07	Undetermined
5	Alegria Canyon	Santa Cruz	21 South	12 East	12, 13 & 14	209	28-401961	03/07/06	Undetermined
10	Three Flags	Santa Cruz	21 South	13 East	6	200	28-401980	03/07/06	Arizona American Water Company - Tubac
32	Rio Rico Urban Unit 4	Santa Cruz	23 South	13 East	2, 3, 10 & 11	367	28-300335	08/27/98	Rio Rico Utilities
36	Pena Blanca Highlands	Santa Cruz	23 South	13 East	13, 24 & 25	2788	28-400010	07/23/99	Valle Verde Water Co.
38	Las Colinas Sagradas	Santa Cruz	23 South	13 East	24 & 25	1040	28-700426	01/24/08	Valle Verde Water Co.

D. Designated Water Providers

Map Key	Water Provider Name	County	Designation No.	Date Application Received	Date Designation Issued	Projected or Annual Estimated	Year of Projected or Annual
A	Baca Float Water Company, Inc.	Santa Cruz	26-400800.0000	08/13/02	11/17/04	333	2011
B	City of Nogales	Santa Cruz	26-401358.0000	05/14/04	04/19/05	6,322	2009

[1] Includes water reports issued under the Water Adequacy program prior to 1980 implementation of the Assured Water Supply program.

[2] Adequacy determinations were based on the information available to ADWR and the standards of review and policies in effect at the time the determination was made. A determination of inadequacy could be due to insufficent physical or legal access to water or poor water quality. The Adequacy Program was replaced by the Assured Water Supply Program in the AMAs in 1980.

[3] Session law from 1981 (HB 2465, Chapter 203) exempts subdivisions from the Assured Water Supply program where "substantial capital investment toward construction prior to 6/12/80 in addition to original cost of buying the land" has occurred.

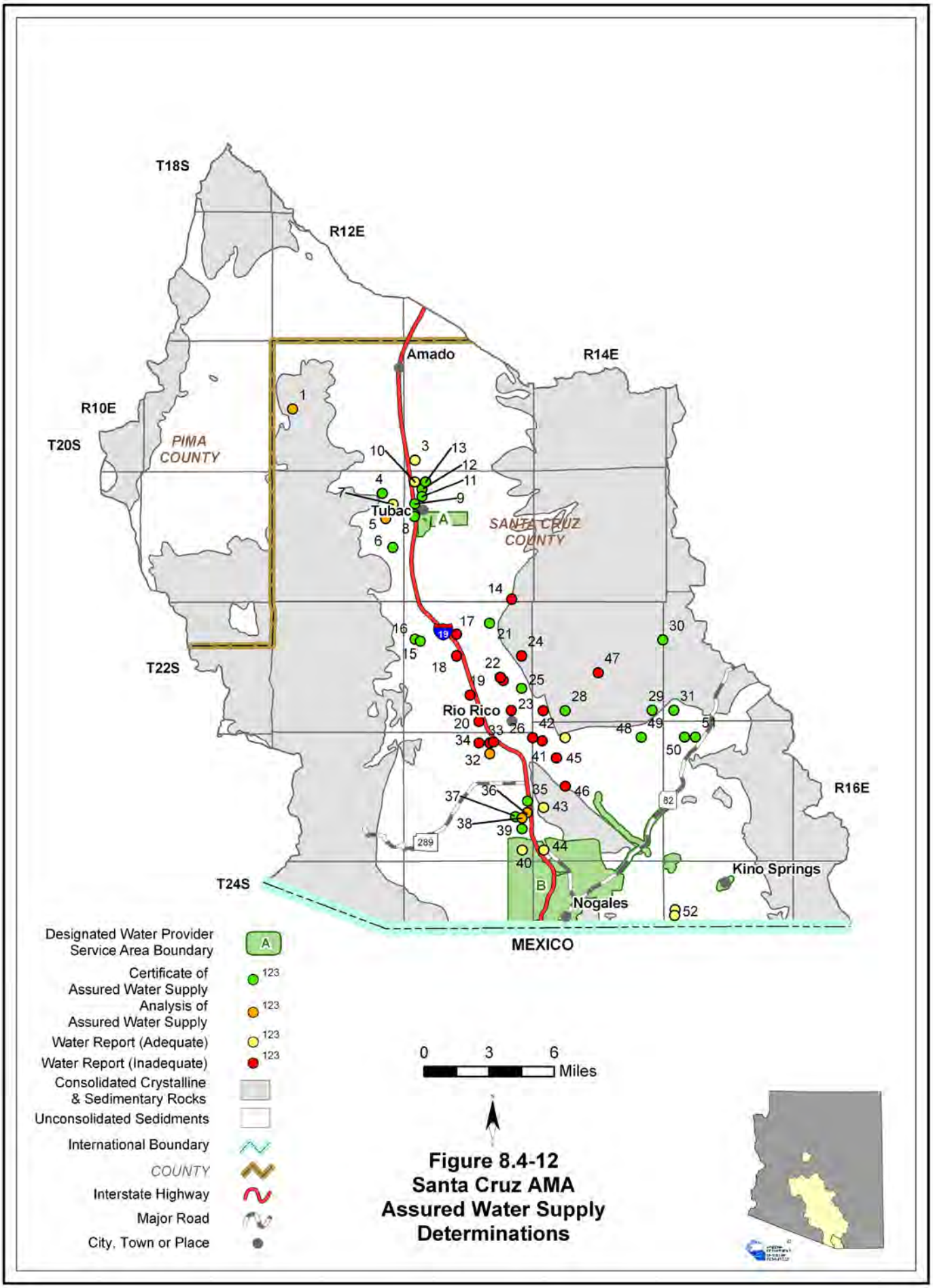


Figure 8.4-12
Santa Cruz AMA
Assured Water Supply Determinations

Santa Cruz AMA
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